

AMENDMENTS TO THE DRAWINGS:

A Replacement sheet for Figure 2 accompanies this paper. In the Replacement sheet, the shading of Figure 2 has been adjusted for better clarification. No new matter has been added. Approval and entry are respectfully requested.

REMARKS

I. Introduction

Claims 1 to 22 are now pending. In view of the following remarks, it is respectfully submitted that claims 1 to 22 are allowable, and reconsideration is respectfully requested.

II. Objection to the Drawings

In regards to the objection of Figure 2 under 37 C.F.R. § 1.83 (a) for allegedly being too dark, a Replacement sheet for Figure 2 accompanies this paper. In the Replacement sheet, the shading of Figure 2 has been adjusted to provide better clarification. No new matter has been added. It is therefore respectfully requested that the objection be withdrawn. Approval and entry are respectfully requested.

III. Objection to the Specification

In regards to assertion on page 3 of the Office Action that the current specification is missing the section title “BRIEF SUMMARY OF THE INVENTION” and that appropriate action is required, it is respectfully submitted that 37 C.F.R. 1.77 (b) merely states that the specification “should” include the above-identified section title but does not require that the specification include such a section title. According, it is respectfully submitted that the Specification is in compliance with 37 C.F.R. 1.77 (b). Approval of the Specification is therefore respectfully requested.

IV. Rejection of Claims 1 to 3 under 35 U.S.C. § 101

Claims 1 to 3 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter. In particular, the Office Action asserts on page 4 that these claims are directed to non-statutory subject matter because they allegedly recite a mental step that a human could perform. Applicant does not necessarily agree with the merits of this assertion. However, to facilitate matters and to expedite issuance of a patent, Applicant has amended these claims in accordance with the Examiner's remarks to indicate that the method is implemented via a computer.

It is therefore respectfully submitted that claims 1 to 3 fully comply with the requirements of 35 U.S.C. § 101, and withdrawal of this rejection is therefore respectfully requested.

III. Rejection of Claims 1 to 5 and 16 under 35 U.S.C. § 103(a)

Claims 1 to 5 and 16 were rejected under 35 U.S.C. § 103(a) as unpatentable over “Intel Technology Journal Q3” by Nicholas P. Mencinger et al. (“Mencinger”) in view of “Application Specific Semiconductor Device Qualification Methodology” by M. Doty (“Doty”). It is respectfully submitted that claims 1 to 5 and 16 are allowable for at least the following reasons.

Claim 1 relates to a computer-implemented method to quantify the reliability test requirements of a package/chip device over a product lifetime, the method including modeling a plurality of different types of ambient and power-driven temperature cycle fluctuations the package/device is expected to undergo over the product lifetime, and determining the accelerated life test requirements that represent each of the plurality of different types of temperature cycles fluctuations.

Claim 4 relates to a method of relating accelerated life test parameters used to assess reliability of a package/chip device to expected frequencies and magnitudes of temperature cycle fluctuations encountered by the package/chip device over a product lifetime, the method including defining a particular market application use for the package/chip device, quantifying expected frequencies and magnitudes of temperature fluctuations of the package/chip device in each of a plurality of temperature cycle fluctuation regimes, based in part on the particular market application use of the package/chip device, and incorporating the quantified expected frequencies and magnitudes of the temperature fluctuations of the package/chip device in each of the temperature regimes into an accelerated life model.

In contrast to claims 1 and 4, Mencinger refers to a mechanism-based methodology for processor package assessments, in which failure mechanisms are modeled with the appropriate physical model. In this regard, Mencinger does not disclose, or even suggest, determining accelerated life test requirements that represent each of a plurality of different types of temperature cycles fluctuations a package/device is expected to undergo over a product lifetime, as recited by claim 1, or incorporating into the accelerated life model quantified expected frequencies and magnitudes of temperature fluctuations of a package/chip device in each of a plurality of temperature regimes over the product lifetime, as recited by claim 4. Indeed, the Office Action admits on pages 6 and 8 that Mercinger does not teach a plurality of temperature cycle fluctuation regimes nor accelerated life test requirements for all situations. Accordingly, Mencinger fails to disclose, or even suggest, the features of claims 1 and 4 with respect to determining the accelerated life test requirements

that represent each of the plurality of different types of temperature cycles fluctuations a package/device is expected to undergo over a product lifetime, or incorporating into an accelerated life model quantified expected frequencies and magnitudes of temperature fluctuations of the package/chip device in each of a plurality of temperature regimes over the product lifetime.

Also in contrast to claims 1 and 4, Doty refers to a strategy for implementation of application specific characterization/qualification involving four application phases. See Slides 1 to 3. In this regard, Doty does not disclose, or even suggest, determining accelerated life test requirements that represent each of a plurality of different types of temperature cycle fluctuations a package/device is expected to undergo over a product lifetime, or incorporating into an accelerated life model quantified expected frequencies and magnitudes of temperature fluctuations of a package/chip device in each of a plurality of temperature regimes over the product lifetime. Instead, Doty determines tests/conditions by applying standard use environments across market segments but not across the four application phases. See Slide 2, which states that “Use Environment Determines Tests, Conditions & Durations”. Indeed, the Office Action merely asserts that “Doty teaches plurality of temperature cycle fluctuation regimes for the operation life cycle of the package/chip ...” See Office Action, page 8 (emphasis added). In this regard, it is respectfully submitted that the Office has failed to consider the other non-operational phases referred to on Slide 3 of Doty, in particular, “Assembly” and “Storage/Transportation”, which would presumably also occur over a product lifetime. Moreover, the Office Action’s assertions on page 8 with respect to what Doty discloses about the operation life phase are incorrect. That is, Doty does not disclose a 0-50 C degree temperature fluctuation occurring 10 times a day, or 0 to 40 C degree occurring twice per day, as asserted by the Office, but rather Doty merely states that 0 to 50 C degrees is the operational temperature range (with no reference on how this fluctuates), and that 40 C degrees is the maximum air temperature (with no minimum cited). Accordingly, Doty also fails to disclose, or even suggest, the features of claims 1 and 4 with respect to determining the accelerated life test requirements that represent each of the plurality of different types of temperature cycles fluctuations a package/device is expected to undergo over a product lifetime, or incorporating into an accelerated life model quantified expected frequencies and magnitudes of temperature fluctuations of the package/chip device in each of a plurality of temperature regimes over the product lifetime.

The Office Action also asserts on pages 6 and 8 that it would be obvious to a person of ordinary skill in the art to combine the teachings of Doty and Mercinger simply because

"Mercinger teaches that a package/processor lifetime can be broken down into different types of fluctuations from the point it manufactured till the end of the package/processor lifetime." It is respectfully submitted, however, that such assertions, even if true (which is not conceded), do not demonstrate the required motivation to modify the mechanism-based methodology disclosed by Mencinger, in the manner contemplated by claims 1 and 4. In particular, such assertions do not provide any motivation or suggestion to determine the accelerated life cycle requirements that represent the different types of fluctuations from the point of manufacture until the end of the package/processor lifetime, or to incorporate into an accelerated life model the different types of fluctuations from the point of manufacture until the end of the package/processor lifetime.

To reject a claim as obvious under 35 U.S.C. § 103, the prior art must describe or suggest each claim feature, and there must be a motivation or suggestion to modify or combine the features in the manner contemplated by the claim. (See Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934 (Fed. Cir. 1990), cert. denied, 111 S. Ct. 296 (1990); In re Bond, 910 F.2d 831, 834 (Fed. Cir. 1990)). This motivation or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). In this regard, it is respectfully submitted that the Office has not provided proper citations to support the alleged motivation or suggestion to combine the prior art references.

Moreover, the cases of In re Fine, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988), and In re Jones, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992), also make plain that a subjective "obvious to try" standard is not proper. In particular, the Court in the case of In re Fine stated that:

Instead, the Examiner relies on hindsight in reaching his obviousness determination. . . . **One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.**

In re Fine, 5 U.S.P.Q.2d at 1600 (citations omitted; emphasis added). Likewise, the Court in the case of In re Jones stated that:

Conspicuously missing from this record is any evidence, other than the PTO's speculation (if it be called evidence) that one of ordinary skill . . . would have been motivated to make the modifications . . . necessary to arrive at the claimed [invention].

In re Jones, 21 U.S.P.Q.2d at 1943 & 1944 (citations omitted). In short, there must be evidence of why a person having ordinary skill in the art would be motivated to modify a

reference to provide the claimed subject matter of the claims. Accordingly, combining these prior art references without evidence of a proper suggestion, teaching, or motivation “simply takes the inventor’s disclosure as a blueprint for piecing together the prior art to defeat patentability — the essence of hindsight.” *In re Dembicza*k, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999).

In view of the foregoing, it is respectfully submitted that claims 1 and 4 are allowable.

Claims 2 and 3 depend from claim 1, and are therefore allowable for at least the same reasons as claim 1.

Claim 5 depends from claim 4, and is therefore allowable for at least the same reasons as claim 4.

Claim 16 recites features essentially analogous to claim 4, and is therefore allowable for at least the same reasons as claim 4. Moreover, claim 16 further recites quantifying frequencies and magnitudes of temperature fluctuations based in part on the shipping route taken by the product, which is neither disclosed nor suggested by Mencinger and/or Doty.

In sum, it is therefore respectfully submitted that claims 1 to 5 and 16 are allowable. Accordingly, it is respectfully requested that the obviousness rejections be withdrawn.

VI. Rejection of Claims 6 to 12, 14 and 17 to 22 under 35 U.S.C. § 103(a)

Claims 6 to 12, 14 and 17 to 22 were rejected under 35 U.S.C. § 103(a) as unpatentable over Mencinger in view of Doty and “ReliaSoft’s ALTA 1.0 On Site Training Guide” (“ReliaSoft”). Claims 6 to 12, 14 and 17 to 22 depend either directly or indirectly from claims 1, 4 and 16, or recite features essentially analogous to at least one of claims 1, 4 and 16, or depend from a claim that recites features essentially analogous to at least of claims 1, 4 and 16, and are therefore allowable for at least the same reasons as claims 1, 4, and/or 16, since the ReliaSoft reference does not cure the critical deficiencies of the Mencinger and Doty references, as explained above.

VII. Rejection of Claims 13 and 15 under 35 U.S.C. § 103(a)

Claims 13 and 15 were rejected under 35 U.S.C. § 103(a) as unpatentable over Mencinger in view of Doty, ReliaSoft and “Semiconductor Device Reliability Failure Models by Ted Dellin et al. (“Dellin”). Claims 13 and 15 depend indirectly from claim 4, and are therefore allowable for at least the same reasons as claim 4, since the ReliaSoft and Dellin references do not cure the critical deficiencies of the Mencinger and Doty references, as explained above.

CONCLUSION

In view of all of the above, it is respectfully submitted that all of the presently pending claims are allowable. It is therefore respectfully requested that the rejections be withdrawn. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is respectfully requested.

Respectfully submitted,

Dated: 8/1/05

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